Zero Retries issue 0028 2022-01-14

Advanced Amateur Radio - Data Communications; Space; Microwave… the fun stuff! The Universal Purpose of Ham Radio is to have fun messing around with radios. - Bob Witte K0NR; Amateur Radio is literally having a license to experiment with radio technology. - Steve Stroh N8GNJ; Ultimately, amateur radio must prove that it is useful for society. - Dr. Karl Meinzer DJ4ZC; We are confronted by insurmountable opportunities! - Pogo; Nothing great has ever been accomplished without irrational exuberance - Tom Evslin; Irrational exuberance is pretty much the business model of Zero Retries Newsletter - Steve Stroh N8GNJ.

Steve Stroh N8GNJ, Editor

Jack Stroh, Late Night Assistant Editor

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Request to Send

Countdown to Hamvention 2022 - May 20-22, in Xenia, Ohio - 18 weeks…

Something resonated with you Zero Retries subscribers in Zero Retries 0027 - there were nearly 800 "views" of that issue - a new record.

I said that *this* issue would be a lookahead for 2022, but enough news has accumulated in the *Zero Retries Interesting Queue* in the last three weeks that I decided to "dump the queue" instead of letting it get larger. As usual for me, the Substack editor system declared *Post too long for email*, so I pushed ~~one~~ several articles into the next issue, at which point the Substack editor system was happier, merely chiding - *Near email length limit*.

Mercifully Whatcom County Washington has finally thawed out from our two weeks of winter (complete with accumulated snow). I can't declare snow season officially over until the very large snow drift in my neighbor's yard melts completely (still calf-deep despite a week of 45°+ temps). We're now back to our usual rain and moderate temps (with occasional *sunbreaks*!) and I'm back to my usual retired male uniform of shorts and T-shirt.

Happy Birthday KK7BKI! I'm so proud to be your Dad!

Ten Amateur Radio Satellites Launched on SpaceX Transporter-3 Mission

As impressive as the above headline sounds, SpaceX's Transporter-3 Mission launched a total of *105 microsatellites* into a 525-kilometer Sun Synchronous Orbit (SSO) on 2021-01-13. From what I've read to date, the launch, deployment, and first stage recovery were flawless (as has become business as usual with SpaceX missions).

Eight of the Amateur Radio satellites were the Tevel Mission.

> The Tevel mission consisting of 8 satellites developed by the Herzliya Science Center in Israel, each carrying an FM transponder, is expected to launch on January 13 at 15:25 GMT on the SpaceX Falcon-9 Transporter-3 mission. This mission also carries AMSAT-EA's EASAT-2 and HADES satellites.
>
> Tevel-1, Tevel-2 ….Tevel-8
>
> Beacon transmissions on 436.400 MHz, (9600bps BPSK G3RUH)
> FM transponders uplink frequency: 145.970 MHz
> FM transponders downlink frequency: 436.400 MHz
>
> All 8 satellites will have the same frequencies, so as long as the footprints are overlapping, only one FM transponder will be activated. The satellites were built by 8 schools in different parts of Israel.

The other two Amateur Radio satellites are EASAT-2 and HADES, both of which have an FM transponder and digipeater.

> Both satellites offer FM voice communications and data relay in FSK or AFSK up to 2400 bps,such as AX.25 or APRS frames. They also broadcast voice beacons on FM with the callsigns AM5SAT and AM6SAT,as well as CW.
> The EASAT-2 satellite, designed and built jointly by AMSAT-EA and students of the European University of the Degrees in Aerospace Engineering in Aircraft and in Telecommunication Systems Engineering, with contributions from ICAI in the communications part.

The article doesn't definitively state who built / sponsored the HADES satellite.

> As for Hades, its payload consists of a miniature camera module that sends the captured images as an audio signal in SSTVmode. The SSTV formats it uses are compatible with Robot36, Robot72, MP73 and MP115.
> The design is based on the one used in the successful mission of the PSAT2satellite, an amateur radio satellite of the United States Naval Academy and brno University of Technology. This chamber has been operational since June 25, 2019: (http://www.aprs.org/psat2.html).
> The camera chip is the Omnivision OV2640, which provides a resolution of up to 2M pixels and compressed output in JPEG. Resolution is limited by the CPU's internal memory (MCU) that controls the camera to 320×240 (typical) or 640×480 maximum. The MCU selected for the control is the STM32F446RET6, which has the smallest possible footprint with connection to DCMI peripheral, necessary for connection with the camera.
> Images can be stored on a 2 MB serial flash memory. The complete SSTV encoder has managed to be implemented in a 4-layer PCB with dimensions of only 38x38mm.
> The MCU can be fully controlled from ground stations. The firmware allows the sending of images of the camera live,of imágenes previously saved in the flash memory or of images encoded in ROM. It also provides advance programming of image acquisition and PSK telemetry with the current status (event counters, temperature, voltage, light conditions, etc.) and a brief summary.
> The described module has been developed and manufactured at the Department of Radioelectronics of the Brno University of Technology in the Czech Republic. Both hardware and firmware designs with the source codes will be available on Github under the MIT license (https://github.com/alpov/SatCam).
> Initially only the EASAT-2 repeater is active. Hades' will be activated by telecommand a few days after launch.
> The frequencies coordinated with IARU for both satellites are as follows:
> EASAT-2
> 145.875 MHz uplink, Modes: VOICE FM (without undertone) and FSK 50 bps, AFSK, AX.25, APRS 1200 / 2400 bps
> 436.666 MHz downlink, Modes: FM voice, CW, FSK 50 bps, FM voice beacon with AM5SAT callsign
> HADES
> 145.925 MHz uplink, Modes: VOICE FM (without undertone) and FSK 50 bps, AFSK, AX.25, APRS 1200 / 2400 bps
> 436.888 MHz downlink, Modes: FM voice, CW FSK 50 bps, SSTV Robot 36, FM voice beacon with AM6SAT callsign

There are some interesting data possibilities in these satellites.

CaribouLite RPi HAT - Going for Production!

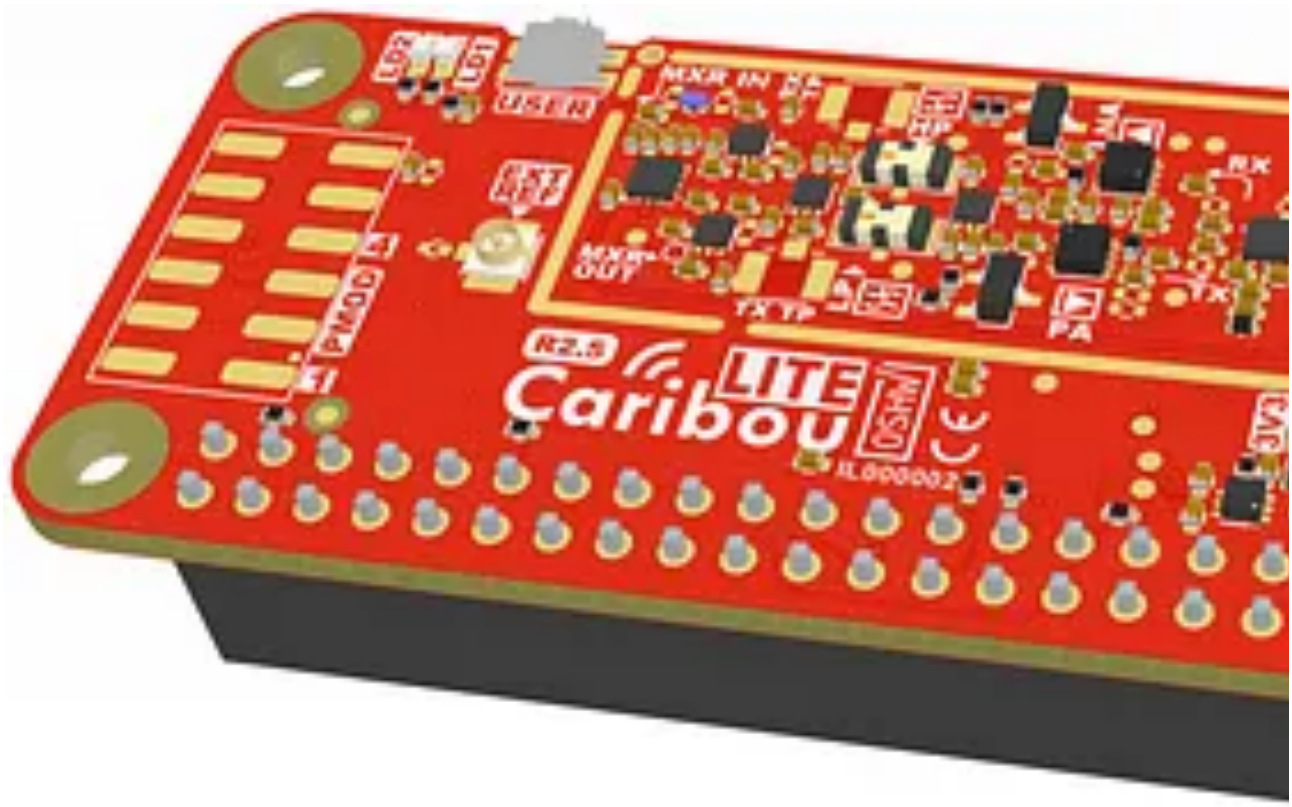

Image courtesy of Crowd Supply / Caribou Lite project

On 2022-01-11, "David M" reported:

> Thank you backers! For your support, interest, and trust!
> We are super excited to say that our first campaign—CaribouLite—was successful, and that we reached our funding goal thanks to you. We are now heading into the manufacturing phase of the project!
> We will continue updating and sharing software, hardware, and production details in the coming months. Production has already been set up with our trusted CM, and we will keep you updated regarding its progress.

CaribouLite is a Raspberry Pi HAT (Hardware Attached on Top) dual-channel software defined transceiver. There are other software defined transceiver HATs, but the CaribouLite is unique in that it's designed in form, and function, to work with the (smaller, and less computationally capable) Raspberry Pi Zero 2W. I was skeptical that the Raspberry Pi Zero 2W had enough compute power for a software defined transceiver, but in a Twitter exchange, the creators assured me that CaribouLite's software runs acceptably on the RPiZ2W.

It was surprising to see how much notice this project garnered from a number of tech websites, blogs, etc. In my monitoring Amateur Radio "media", I didn't note any significant attention about CaribouLite from Amateur Radio. This crowdfunding project was conducted on Crowd Supply, with a goal of raising $112,000. As of this writing, they have raised $134,078 from 653 backers. My two units are now on order and are projected to ship in May, 2022.

ARRL Foundation to Create Club Grants Program

From the ARRL Letter, 2022-01-13:

> A new ARRL Foundation Club Grants program, funded by a grant from Amateur Radio Digital Communications (ARDC), will make $500,000 available to radio clubs. The program will provide up to $25,000 for worthy club projects. Requests for more than that will be referred back to ARDC.
> ARRL has long recognized that it is in the best interests of amateur radio to encourage and support amateur radio clubs. Clubs historically have recruited, licensed, and trained new radio amateurs and have provided the community setting for radio amateurs to continue their education and training. The new Club Grants program will help clubs to more easily provide and expand their important services. Beginning in April 2022, amateur radio clubs will be able to apply for these grants by filling out a simple form on the ARRL website. The ARRL Foundation will evaluate the grant proposals. The Foundation was established in 1973 to advance the art, science, and societal benefits of the amateur radio service by awarding financial grants and scholarships to individuals and organizations in support of their charitable, educational, and scientific efforts.
> A key criterion for determining awards will be how the project will advance amateur radio in the grantee's community. In most cases, this process should take no longer than 90 days.
> ARRL Foundation President David Woolweaver, K5RAV, shared his enthusiasm about this new program. "This program will substantially contribute to the growth of amateur radio clubs and their efforts to expand and support the amateur radio community," he said.
> ARDC is a California-based foundation that awards grants to projects and organizations that follow amateur radio's practice and tradition of technical experimentation in both amateur radio and digital communication science. ARDC Executive Director Rosy Schechter, KJ7RYV, noted that this program will streamline the process for getting club projects funded, so that clubs can get started on these projects more quickly.
> "We're very excited about working with the ARRL Foundation on this program," said Schechter. "We can't wait to see what kinds of creative things clubs will do with these grants." -- Thanks to ARDC

In the January 2022 ARDC Newsletter, KJ7RYV also said:

> We at ARDC are enthusiastic as well. The program will streamline the process for getting club projects funded, so that they can get started on these projects more quickly. We can't wait to see what kinds of creative things happen because of these club grants!

Whew; this is another "big one" from ARDC that I couldn't talk about until it was made public. You were probably looking for something related to Zero Retries Areas of Interest - there wasn't any. I'm including this announcement in Zero Retries because I think it may well inject a breath of life to some Amateur Radio clubs that have been limping along with various issues - ailing repeaters that really should be replaced, building up "get started" loaner kits for new hams, buying new radios for shared systems that are capable of higher data rates (Winlink stations enabling VARA FM), etc.

There are three notable things about these grants for Amateur Radio clubs:

- They'll be structured to be simple to apply for - just fill out the form. It has surprised me how many people / organizations in my circle are intimidated in writing a basic grant proposal, suffering from "paralysis of analysis". This should make it easier - we're all comfortable filling out forms.
- ARDC asked about, and received assurances, that these ARRLF grants will be available to *any* US Amateur Radio club, not just ARRL-affiliated clubs.
- Unlike (direct) ARDC grants, these grants will not require the receiving organization to have 501(c)(3) status, government affiliation, or educational institution affiliation.

From experience, if you're interested in applying for these ARRLF Amateur Radio Club grants… ***start now***! Gather your stakeholders and hash out what you want to do, how you want to do it, and what a realistic timeline is. Most importantly, decide *who* is going to do *what*; that's a glaring failing with many grants. Getting grant funds in hand *does not solve all*. Organizing a grant proposal takes longer than you imagine when you're dealing with a volunteer group. If you start now, when ARRLF begins accepting applications in April, your grant proposal will have a huge head start.

And, if your group has been limping along as an informal group with no formal organization, perhaps the possibility of a modest grant to make your group's ideas a reality is some impetus. "Immediately" would be a good time to get started on that, including registering with the ARRL as an affiliated club (can't hurt) and perhaps requesting an FCC Amateur Radio Club callsign.

I echo KJ7RYV's sentiment about looking forward to "… what kinds of creative things clubs will do with these grants".

Bridgecom Systems Decides to Re-enter the 222 MHz Equipment Business

*This is a followup to a story in Zero Retries 0020 - **Bridgecom Systems Exits the 222-225 MHz Repeater Business**.*

In the Facebook 220 MHz Radio Group, Josh Landewee (Inside Sales Representative at Bridgecom Systems) made this announcement on 2021-01-04:

> After much consideration and feedback from you all, Bridgecom has placed another order for modules to support the 220 band. The lead time is extremely long so it will be about 8 months before we receive them but we have NOT given up. We currently have the ability to support 3 more 220 repeaters. After that they will be discontinued until we receive the new stock.

In discussions prior my purchase of a Bridgecom Systems BCR-220 repeater, Landewee told me that the unit I was buying was *the very last BCR-220 that Bridgecom Systems would manufacture*. They were simply out of stock of the unique components required for such repeaters, with little prospect of purchasing more because of slow sales of mobile radios and repeaters for the 222-225 MHz band.

I'll speculate that the backstory of those three additional repeaters for sale is likely that, having ordered more "220 modules", Bridgecom Systems feels that they can deplete their repair stock a bit deeper than they otherwise would have without that new order.

When asked if this announcement impacts the (out of stock) Bridgecom BCM-220 (mobile) radio, Landewee replied:

> Yes... We will be able to support the BCM-220 as well, as soon as the new stock arrives. It will likely be 6-8 months before we are stocked back up on BCM-220's.

Although I've apparently lost the status of my Bridgecom Systems BCR-220 repeater of being the "last one", I am happy that there will be more BCR-220s available, and apparently more BCM-220s.

Besides it being one of the few monoband 222-225 MHz radios, the BCM-220 radio has a "flat audio" input / output and thus might be a good radio for high speed data use. One "gotcha" is that Bridgecom uses a unique connector (high density D15) for this interface, but that's a pretty minor detail. It's yet another item in the N8GNJ Labs queue for 2022 to get the two BCM-220s that I have set up for high speed data use, and test them.

It continues to mystify me why companies like Bridgecom Systems use Facebook to make significant business announcements like this, but this is an example of why I continue my presence on Facebook despite Facebook's misdeeds and unethical behaviors. If you're not there, you'll never see such information.

Silent Keyboard Update - WA4DSY and N1URO

WA4DSY In Zero Retries 0027 I named Glynn "Buck" Rogers K4ABT and Tom Clark K3IO as silent keyboards in 2021. I neglected to mention that Dale Heatherington WA4DSY also became a silent keyboard in 2021. WA4DSY was famous to those of us who aspired to "Advanced Data Communications" in Amateur Radio because he created a 56 kbps radio frequency modem that worked and was usable by mere mortals… if a bit expensive at the time. The WA4DSY 56k modems (there were multiple versions) were real radio frequency modems - data in, RF out - just add a 28 MHz to 144 / 222 / 440 MHz transverter. WA4DSY's "other" claim to fame was being co-founder of Hayes Microcomputer Products (Hayes dialup modems).

N1URO In the first few week of 2022, Brian Rogers N1URO became a silent keyboard. From Brian Webster N2KGC on the 44net mailing list:

> It is with great sadness that I pass along the news that Brian Rogers N1URO is now a silent key. He passed on Tuesday evening January 4th, 2022. Brian was the author of the URONode packet radio software and past president of the Eastnet Amateur Radio Network (https://www.eastnetpacket.org/). He was an avid packet user and contributor to various software packages, not just his own. He was also the AmprNet coordinator for the states of MA, NH, VT, PA, MD, DE, CT, RI and ME.
> Professionally his was an IT consultant and ran his company Network Continuum Connecticut (https://www.nc-ct.net/).
> He was a mentor to many who wanted to operate packet nodes or set up an apmr.org station. He had a broad knowledge of many other node operating systems, keeping nodes of all types running at his QTH. He was a wealth of detailed knowledge and will be missed immensely.
> Funeral arrangements are;
> Friday Jan 14th
> 5 to 7 pm with a small service at 7 pm
> Ahern Funeral Home
> 111 Main Street
> Unionville, Ct

In a later post to the 44net mailing list, N2KGC said:

> We will strive to have [N1URO's] projects live on as best we can. One of the EastNet officers has already spoke with the family and at the appropriate time after the service he will be helping the family work things out and go through his possessions. We are doing our best at this point to make backups of any data we can. We have already made contact with Chris at ARDC to appoint an interim 44 net coordinator for the states he covered and we are quickly working on solutions to create alternate AXIP links on the packet system. We are also working on a possible plan to move the packet equipment that was at his home to another site. Brian had mentioned to me for quite a few years that he was concerned what might happen should his health get worse. We tried to get some documents built for URONode but that did not get finished. Your pages for the CentOS system are probably one of the better sources we have at this time. One is never fully prepared for when these things happen.

Updata

- In Zero Retries 0017 I mentioned this book:
  ***Ham Radio is Alive and Well** by Gary Drasch K9DJT is a book title that grabbed my attention during a quick browsing of the book section of DX Engineering.*
  I've now read it and I can recommend it to 60+ males who had an Amateur Radio license in their youth who have nostalgic memories of operating HF CW, contesting and DXing. This book is a love letter to lapsed Amateur Radio Operators of the author's demographic who assumed Amateur Radio was all but dead in the age of pocket computers and Internet. I gifted a copy to Doc Searls (age 74 and formerly WV7VXH) because he mentioned *his* fond memories of operating CW and HF in his youth. I hope he enjoys it.

- In Zero Retries 0021, I mentioned ordering an **AMSAT CubeSatSim PCB Set**. I received them a few days ago. As I type this, I'm staring at the three printed circuit boards on my desk and I marvel that these three PCBs form the basis of a (mockup, but working) "satellite" that when fully built, isn't much bigger than a softball. This will be yet another project for N8GNJ Labs in 2022.
- I'm sad to report that I placed an order with **Inductive Twig** for a few items prior to their stated going out of business date of 2021-12-31. My card was charged (more than $350) during the order process, but since then, no response whatsoever. I'll soon begin the process of trying to reverse the charges given *no response at all* from Inductive Twig.

Join the *Fun* on Amateur Radio

If you're not yet licensed as an Amateur Radio Operator, and would like to join the fun by *literally having a license to experiment with radio technology*, here are some pointers:

- **Ham Radio for Dummies** by Ward Silver N0AX is a great overview of Amateur Radio. N0AX is a gifted writer and HRFD is now in its 4th edition.
- My two favorite **YouTube** channels for a good overview of Amateur Radio are AmateurLogic.TV. and Ham Nation (part of Ham Radio Crash Course). These folks just seem to have so much fun!
- Dan Romanchik KB6NU offers a free **No-Nonsense Study Guide** for the Technician test (PDF).
- HamExam.org Amateur Radio Practice Exams offers good **Flash Card and Practice Exams**.
- When you're ready to take an **Amateur Radio examination** (Tech, General, or Extra), W1MX - The MIT Amateur Radio Society offers remote exams, free for students and youngsters. *There are apparently many other remote exam options*.

Bonus - with an Amateur Radio license, you'll be more attractive on dates 😀

Closing the Channel

- My ongoing Thanks to Tina Stroh KD7WSF for, well, *everything*, Bill Vodall W7NWP as *Zero Retries Instigator in Chief*, and Larry Gadallah NM7A for his long term encouragement about Zero Retries.
- My ongoing Thanks to pseudostaffers Dan Romanchik KB6NU, Jeff Davis KE9V, and Steve Lampereur KB9MWR for continuing to spot, and write about "Zero Retries Interesting" type items, on their respective blogs, from Amateur Radio and beyond, that I don't spot on my own.
- For those that get the reference, Southgate Amateur Radio News is, to me, the "Slashdot" of Amateur Radio, and I follow them both on Twitter and their RSS feed. They consistently surface "Zero Retries Interesting" stories.

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Email issues of Zero Retries are "instrumented" by Substack to gather basic statistics about opens, clicking links, etc. I don't use such information in any way other than (in the absence of much feedback) getting some satisfaction that the data shows that people actually do read Zero Retries.

All previous issues of Zero Retries are available without restriction (no paywalls). For some background, Zero Retries 0000 was the **Introduction Issue**. Zero Retries 0026 and Zero Retries 0027 were a **2021 Year End Review** of Zero Retries.

More bits from Steve Stroh N8GNJ:

- SuperPacket blog - *Discussing new generations of Amateur Radio Data Communications - beyond Packet Radio (a precursor to Zero Retries)*
- N8GNJ blog - *Amateur Radio Station N8GNJ and the mad science experiments at N8GNJ Labs - Bellingham, Washington, USA*

Thanks for reading!
Steve Stroh N8GNJ
Beautiful, usually balmy Bellingham, Washington, USA
2022-01-14

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